



# University of Melbourne Equine Centre Werribee

NEWSLETTER OF THE UNIVERSITY OF MELBOURNE'S  
FACULTY OF VETERINARY SCIENCE



SEPTEMBER 2008

## Dear Colleagues,

AS WE ENTER THE EQUINE SEASON 08-09, I THOUGHT IT WOULD BE GOOD TO RECAP ON A FEW HAPPENINGS AND EVENTS AT THE EQUINE CENTRE, UNIVERSITY OF MELBOURNE, WERRIBEE.

I have just returned from the equestrian portion of the Olympics in Hong Kong, where I was a treating vet. Last year at the practice event ("Good luck Beijing" games) I arrived in Hong Kong and we had some hot weather followed by a typhoon. This year I arrived and almost immediately (but prior to 08/08/08!) a typhoon descended upon us, however, once again we were lucky and wind speeds were very mild in comparison to what they can be. The weather was very kind to us on the Cross Country day of the three day event, so that it was almost uneventful (from an eventer's point of view). We had spent a lot of time and training ensuring the horses could be cooled adequately. The misting tents and the "cooling teams" were advantageous and necessary, even though the day was so mild (for August in Hong Kong). It was great to see the Australian team do so well in the eventing and I was able to catch up with Sonja Johnson and "Ringwoud Jaguar" who are both great favourites at the Equine Centre, University of Melbourne.

Kate by cross-country course – Beas River



Kate and crew of vets (note: find the 4 Australians!) at Hong Kong



The two venues at Sha Tin race course and at the Beas River Country Club were both superb and enormous revenue was spent to ensure that facilities were optimal. A few years ago I was sent a DVD of the Beas River Country Club venue. It was shortly after construction had started at Beas River for the conversion of a very lovely golf course into the cross country course for: a) the "Good Luck Beijing" practice run in August 2007 and b) readiness for the actual 2008 Olympics. It was rather amusing as you could see a few "rather peeved" golfers glaring at a bunker being converted into a cross country jump! In 2008, the cross country course was a little shorter than expected with the same number of "efforts", which caused some controversy as horses didn't have that intermediate part in which they can gallop without "efforts", which is usually perceived as a recovery phase. So all in all, it was an interesting experience and I was fortunate enough to work with a great team of veterinarians from all over the world.

Sonja at trot-up





## PROFESSIONAL SUCCESS

On to local news, our residents, **Liz Walmsley** (equine surgery, second year resident), **Gareth Trope** (equine surgery, second year resident), **Laura Fennell** (equine medicine, second year resident) and **Grace Forbes** (equine medicine, first year resident) did exceptionally well in June 08 and all became Members of the Australian College of Veterinary Scientists (MACVSc) in Surgery of Horses and Medicine of Horses respectively. So that was a great thrill. Laura Fennell couldn't get enough of exams – she had decided to sit her certificate of Medicine (Stud Medicine) in the UK this year, and has already completed the written (at midnight – so she could satisfy the examiners that she was doing it simultaneously with the UK candidates) and will sit her oral after she attends and presents at the British Equine Veterinary Association (BEVA) conference in September.



Gareth and Laura have presented at Science week and Bain Fallon respectively and there will be a taste of their presentations and posters in the following pages.

Liz and Grace are currently in Scone for another few weeks, each undergoing surgical and medical training with Angus Adkins and Jane Axon respectively, so we are very lucky and thank all at Scone for their great efforts. Gareth also had a wonderful time at New Bolton Centre, University of Pennsylvania, PA, USA in April of this year. He spent his time with the surgery section and was very lucky in being able to work with Eric Parente, Dean

Richardson, Louise Southwood [Australian surgeon – Louise was a resident at Colorado State University when I was faculty, and she has since gone on to become boarded not only in Equine Surgery (Diplomate ACVS), but also in emergency medicine and critical care!] Anyway we are really grateful to all at New Bolton Centre, as Gareth was able to learn an immense amount.

## VETS IN PRINT

Tias Muurlink has had a number of publications accepted - these include:



- 1) A cranial intercondylar arthroscopic approach to the caudal medial femorotibial joint of the horse. Muurlink T; Walmsley J; Young, D; Whitton C. Equine vet J 40: 2008.
- 2) Case Report: Successful Laparoscopic Surgery for a Uterine Leiomyoma in a Mare. Muurlink T; Walmsley J; Whitton C. Equine vet Educ 20: 2008.
- 3) Case Report: Splenectomy in a Foal to Control Intra-Abdominal Haemorrhage caused by Splenic Rupture. Muurlink, MA; Walmsley, JP; Savage CJ; Whitton RC. Equine vet Educ 20(7): 362-366, 2008.

So we look forward to reading these in print in the next couple of editions of the EVJ and EVE. Bravo, Tias! These are really interesting papers and this is a fabulous start to Tias' endeavours to sit for fellowships in Equine Surgery next year and we wish him all the best.

## NEW FOAL FACILITIES

Over the last twelve months we have installed and received new foal facilities, including beautiful mare-foal stalls with foal enclosures, in which foals can receive intensive care on mats with infusion pumps and even ventilators (this happened recently) with the mare still being able to maintain contact with her foal. So this step forward is really exciting, as we take foal intensive care to a new level.





### JET SET VETS

Two surgeons, **Chris Whitton** and **Cate Steel** have returned from international conferences. Chris attended the 17<sup>th</sup> Annual Scientific Meeting of the European College of Veterinary Surgeons (ECVS) in Basel, Switzerland. Here, Chris presented some of the work that he, Tias (M.A. or T.!) Muurlink and John Walmsley had performed in the last 3 years. The title was: 'Investigation of a cranial arthroscopic approach to the caudal pouch of the medial femorotibial joint of the horse' by T Muurlink, J Walmsley and C Whitton. He met up with Jim Vasey of Goulburn Valley Equine Hospital where Jim presented on some of Robyn Charman (a former resident from Goulburn Valley Equine Hospital and a current out-of-hours surgeon at the Equine Centre), Angus McKinnon, Tom Russell and Jim's research: 'The surgical treatment of carpal flexural deformity in 72 foals' and 'Aspects of treatment of septic orthopaedic conditions in foals' by Kirsten Neil and Jim, so Victoria was well represented.



Cate Steel with her love of soft tissue and emergency surgery attended a different surgical meeting, the 9<sup>th</sup> International Colic Research Symposium in Liverpool, UK.

Both of these meetings were beneficial to Chris and Cate and to all of us at the Equine Centre, as on their return, they both gave presentations on the meetings to us. We also managed (well, the younger generation aka the residents!) to do a video hook up so that Chris' presentation and summaries could be heard and seen by the residents and interns at Goulburn Valley Equine Hospital.

### NURSING

**Lynette Jackson**, our head nurse was honoured recently as she received the certificate of recognition as 2008 Student of the Year in Victoria – for achieving excellence in learning through dedication and commitment. This award was given by the Animal Industries Resource Centre. It is rather exciting that another of our excellent nurses, Krystle Mills, received this award in 2007, so bravo! This really thrills me, as I think that the Equine Centre is such a great place for intensive cases and our nursing staff, as well as our residents, students and clinicians, are imperative for this occurrence.



### RESEARCH PROJECTS

Another exciting event is that the Equine Centre is running a clinical trial on Tildren® as a preventative for shin soreness in Thoroughbred racehorses. Tildren® modifies bone metabolism and is currently used in racehorses to treat a variety of lameness conditions involving bone. Two year olds entering training will be treated with Tildren® or saline and followed through their preparation to determine if there is a reduced incidence of shin soreness in treated horses. If you have any trainers you feel would be interested in participating or would like more information please contact Chris Whitton on (03) 9731-2268.

Laura Fennell and Kate Savage are still looking for horses with pathological arrhythmias (now including atrial fibrillation<sup>1</sup>) with or without a murmur. These horses may be able to undergo cardiac evaluation, blood Troponin testing, electrocardiographic telemetry at rest and during treadmill evaluation (if the horse is able) and echocardiography at a significantly reduced price. These projects could not be done without the help of Sally Church, Grace Forbes, Tias Muurlink and Ken Hinchcliff. Please call Laura Fennell and/or Kate Savage on (03) 9731-2268 if you would like to discuss potential cases.

Grace Forbes, Simon Bailey, Sally Church and Kate Savage are about to embark on some exciting research projects. One involves finding out the use of snake venom detection kits and another is looking into endotoxaemia in horses. Stay tuned for exciting results next year.

Soon, we also will have more data from Charlie El Hage's study into the immunological responses in horses vaccinated for Equine Influenza in Victoria.

We have really enjoyed working with a huge variety of horses, owners and trainers this year. Some have even mentioned us in their websites, for example – [www.starspect.com.au](http://www.starspect.com.au)

We look forward to speaking to you and seeing you as the silly season (yes, I mean the Equine season, not Christmas) is upon us. I would also like to extend our sincere thanks to the practitioners who have supported us in the last 6 months – we really appreciate your support of the Equine Centre and the University of Melbourne Faculty of Veterinary Science students.

Sincerely,

C. J. (Kate) Savage BVSc(hons), MS, PhD,  
Diplomate ACVIM  
Specialist in Equine Medicine  
Head, Equine Clinical Services  
Equine Centre  
University of Melbourne

<sup>1</sup>Please note that our research project does not include costs relating to the actual conversion of atrial fibrillation.



## FATAL FRACTURES OF THOROUGHBRED RACEHORSES – 3 DIMENSIONAL MICROSTRUCTURE OF THE METACARPUS

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### INTRODUCTION

Catastrophic limb injury is the major cause of Thoroughbred fatalities on Victorian racecourses with condylar fractures of the third metacarpal bone the most common of these (Boden et al. 2006; Parkin et al. 2004). Findings from microstructural studies are consistent with fatigue fractures that propagate from the palmar condylar joint surface (Radtke et al. 2003). Local increases in subchondral bone density in the palmar metacarpal condyle of racehorses occur in response to training resulting in density gradients that have been implicated in fatal fractures (Riggs et al. 1999).

### AIM

To test the hypothesis that increased distal metacarpal bone density is associated with fatal metacarpal condylar fractures.

### METHODS

The distal forelimbs of racehorses euthanased on Victorian racetracks because of metacarpal fracture (cases) or fractures of other bones (controls) were examined. Metacarpal palmar condyles (mainly cancellous bone) and midshaft (cortical bone) were examined with high resolution quantitative micro CT (Scanco X-treme). Variables were compared using a t-test and also adjusted for age group ( $\leq 3$ yo,  $>3$ yo) with analysis of covariance.

### RESULTS

There were 16 horses; 9 cases and 7 controls. Palmar condyles from the fractured limbs of cases had lower bone volume fraction (BVF) (Fig) and lower trabecular number (TbN) than the fractured limbs of controls ( $P < 0.01$ ). Midshaft variables were not different between cases and controls (Figure 1) except that apparent material density was greater in the non-fractured limbs of cases than the non-fractured limbs of controls ( $P < 0.05$ ). Cases were younger ( $3.3 \pm 1.4$  years, mean  $\pm$  SD) than controls ( $5.1 \pm 1.9$  years) ( $P < 0.05$ ) and age correlated with BVF ( $P < 0.01$ ) and TbN ( $P < 0.05$ ). After adjusting for age group the difference in BVF decreased ( $P = 0.11$ ), but TbN differences remained significant.

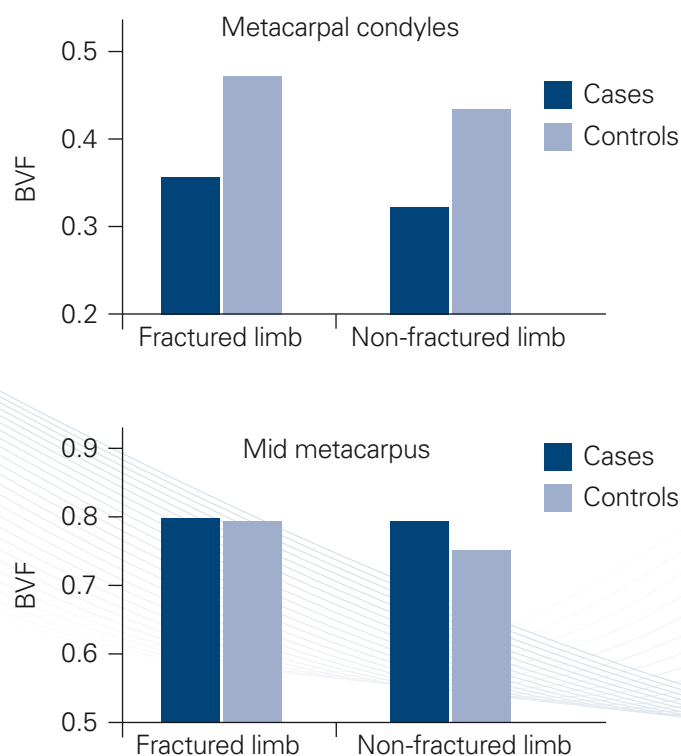


FIGURE 1

BVF mean  $\pm$  sem distal metacarpal condyles and mid metacarpus. signif for case relative to control  $P < 0.05$

### CONCLUSION

Racehorses suffering condylar fractures are younger and have a lower BVF, with fewer trabeculae in their distal metacarpus than horses that fracture at other sites. In this small sample increased subchondral bone density did not contribute to condylar fracture.

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# USE OF A SUGAR REFRACTOMETER TO PREVENT FAILURE OF TRANSFER OF PASSIVE IMMUNITY ON A STUDFARM

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## INTRODUCTION

Neonatal foals are reliant upon the ingestion of colostral immunoglobulins to confer humoral immunity. Failure of transfer of passive immunity (FTPI) has been associated with an increased risk of neonatal infections, septicaemia and mortality.<sup>1-3</sup> Colostral derived immunoglobulin (IgG) concentrations peak in foal serum at approximately 24 hours of age.<sup>4</sup> FTPI in the foal is defined by serum IgG concentrations less than 400mg/dL. Partial failure of transfer of passive immunity (PFTPI) is defined by serum IgG concentrations between 400mg/dL and 800mg/dL.<sup>4</sup> Failure of transfer of passive immunity may arise from failure to ingest sufficient quantities of colostrum, ingestion of colostrum with low immunoglobulin content, or failure to absorb immunoglobulins from the gastrointestinal tract.<sup>5</sup> It has been suggested that between 250ml and 2000mL of good quality colostrum must be ingested within the first 6-8 hours of life to prevent FTPI.<sup>4, 5</sup> Colostral quality may be quantitatively measured using sugar refractometry. Colostrum containing >60g/L IgG having a refractive index of >23%.<sup>6, 7</sup>

## ABBREVIATIONS

FTPI	Failure of Transfer of Passive Immunity, IgG <400mg/dL
PFTPI	Partial failure of Transfer of Passive Immunity, IgG 400 - <800mg/dL
RI	Colostral refractive index
IgG	Immunoglobulin



Figure 1. Sugar/ Brix refractometer 0-32%, Technika, Scottsdale, Arizona, USA



Figure 2. A commercial turbidimetric immunoassay, DVM Rapid Test™, VDX Inc, Belgium, Wisconsin, USA

## OBJECTIVES

To determine whether FTPI may be eliminated on a studfarm through the measurement of colostral IgG using a sugar refractometer, and the supplementation of foals from dams with low colostral IgG (RI <20%

## MATERIALS AND METHODS

Data were analysed from 377 foals and 295 mares in the 2005 - 2007 seasons. Post-foaling pre-suckle colostrum was sampled from each dam and analysed with a sugar refractometer with an upper limit of sensitivity of 32%. (Figure 1). The majority of foals (40/50) born to dams with colostral RI less than 20% were supplemented with additional colostrum. A further seven foals from dams with RI ≥20% were supplemented as deemed necessary by foaling attendants. Supplementation was provided via nasogastric intubation and administration of banked colostrum with a refractive index of >23% on one or more occasion for a total volume of 300-1200mL. Serum IgG concentrations were measured at approximately 24 hours of age using a commercial turbidimetric immunoassay with an upper limit of sensitivity of 3000mg/dL. (Figure 2). Interval regression was used to model the association between mare colostral RI and foal IgG. This method takes into account the upper limit of sensitivity for IgG (censoring). Generalized estimating equations with a robust standard error and exchangeable correlation structure were used to compare the proportion of maiden and non-maiden mares that had foals with inadequate IgG. Generalised estimating equations account for multiple foals per mare. Analysis was done with Stata 10 (StataCorp 2008)

## RESULTS

The prevalence of FTPI in all foals, supplemented and non-supplemented, was 0.5% (n=2) and of PFTPI was 3.7% (n=14). Of all mares, 9% of maidens (6/67) had foals with IgG <800mg/dL, whereas 3% (10/309) of non-maiden mares had foals with IgG <800mg/dL (P = 0.03). (Table 1). Furthermore, three foals born to dams with very high colostral RI (>30%) suffered PFTPI and all were maidens. Half of all foals had an IgG greater than 2350mg/dL. (Chart 1). There was a significant association between colostral RI and foal IgG (P<0.001). (Chart 2).



RESEARCH

TABLE 1. FTPI / PFTPI (IGG LESS THAN 800MG/DL)

Mare ID	Mare Age	Parity	Foal IgG	col %	Supplemented
1	9	6	301	17	Yes
2	11	5	347	15	No
3	10	4	432	16	No
4	7	1	451	9	Yes
5	9	1	462	31	No
6	6	1	583	31	No
7	8	2	622	24	No
8	5	1	647	>32	No
9	21	15	749	18	Yes
10	10	2	749	13	Yes
11	12	4	752	19	No
12	9	4	752	25	No
13	11	7	772	20	No
14	10	2	772	15	Yes
15	7	1	775	12	Yes
16	5	1	794	19	No

Maiden mares are highlighted in blue

CHART 1. FOAL SERUM IGG CONCENTRATION

Serum IgG concentration n=377

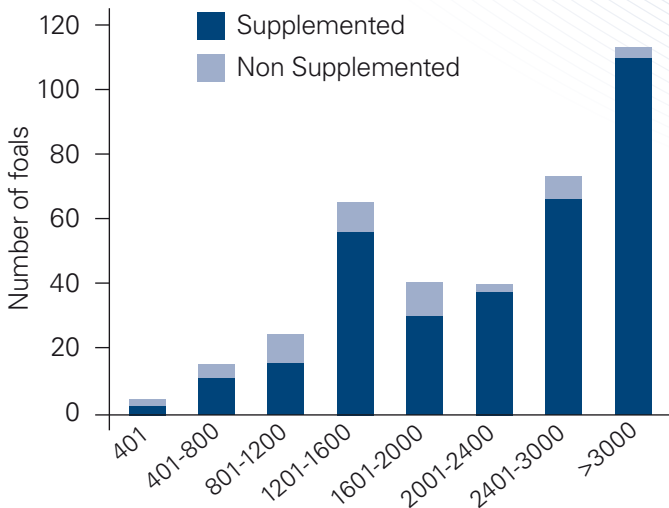
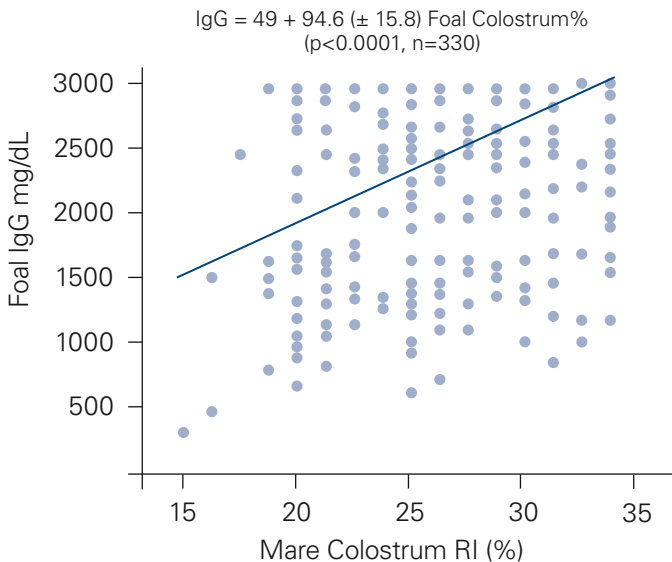


CHART 2. RELATIONSHIP BETWEEN MARE COLOSTRUM RI (%) AND FOAL IGG

Excludes n = 47 supplemented foals



DISCUSSION

Based on other studies reporting a worldwide prevalence of FPTI of 2.9-16%<sup>2,3,7-9</sup> this investigation demonstrated an approach that may be adopted to minimise FTPI. This study identified a prevalence of FTPI (0.5%) that was far less than previous Australian reports of 10%<sup>3</sup> – 16%<sup>2</sup>, and likely reflects the early detection of foals at risk of FTPI and intervention in the form of colostrum supplementation. Ten foals failed to be identified as being at risk of FTPI/PFTPI and did not receive colostrum supplementation. Two of these foals were from the same dam, and were not supplemented despite low colostrum RI. Five foals suffered PFTPI despite adequate colostrum RI. It is likely that these foals were prevented from nursing an adequate volume of colostrum in the first hours of life due to poor behaviour of the mare, or neonatal illness. Six foals that received colostrum supplementation had IgG concentration <800mg/dL. This suggests that the volume of colostrum administered was inadequate, or that due to neonatal illness immunoglobulins were rapidly catabolised. This investigation demonstrated that through minimal intervention the prevalence of FTPI can be greatly diminished, thus potentially reducing financial losses on studfarms. Maiden mares must be closely observed to ensure they allow foals adequate access to nursing in a timely manner.

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